Name:______________________________ Date:______________

Polynomial Factoring solution (version 37)

1. **The quadratic formula says if $ax^2+bx+c=0$ then $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2+6x+21=0$$

Simplify your answer(s) as much as possible.

Solution

$$x=\frac{-(6)\pm\sqrt{(6)^2-4(1)(21)}}{2(1)}$$

$$x=\frac{-(6)\pm\sqrt{36-84}}{2(1)}$$

$$x=\frac{-6\pm\sqrt{-48}}{2}$$

$$x=\frac{-6\pm\sqrt{-16\cdot 3}}{2}$$

$$x=\frac{-6\pm 4\sqrt{3}\,i}{2}$$

$$x=-3\pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $8-5i$ and $-4+2i$ in standard form $(a+bi)$.**

Solution

$$(8-5i)\cdot(-4+2i)$$

$$-32+16i+20i-10i^2$$

$$-32+16i+20i+10$$

$$-32+10+16i+20i$$

$$-22+36i$$

Polynomial Factoring solution (version 37)

3. **Write function $f(x) = x^3 + x^2 - 30x - 72$ in factored form. I'll give you a hint: one factor is $(x+3)$.**

Solution

$$\begin{array}{r|rrrr} & 1 & 1 & \text{-30} & \text{-72} \\ \text{-3} & & \text{-3} & 6 & 72 \\ \hline & 1 & \text{-2} & \text{-24} & 0 \end{array}$$

$$f(x) = (x+3)(x^2 - 2x - 24)$$

$$f(x) = (x+3)(x+4)(x-6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+8) \cdot (x+3)^2 \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.